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AMSAT NEWS SERVICE
ANS-074

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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SB SAT @ AMSAT $ANS-074.01
ANS-074 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 074.01
>From AMSAT HQ KENSINGTON, MD.
DATE March 15, 2015
To All RADIO AMATEURS
BID: $ANS-074.01

AMSAT 2015 Hamfest Recruiting Brochure Available

As hamfest season nears we've added a link to AMSAT's 2015 Recruiting Brochure to the page listing the hamfests our AMSAT Field Ops guys and helpers plan to attend:

http://www.amsat.org/?page_id=218

This color PDF file is a recruiting tool to help share the excitement of AMSAT and amateur radio in space. The brochure designed to print double-sided and be folded tri-fold. The AMSAT office maintains a small stock of these printed brochures. They have been included in the hamfest support boxes available to support your event. For more information about these kits, contact:
martha at amsat dot org

If you are setting up a hamfest or club support activity let our
Director of Field Operations, Patrick WD9EWK know via
wd9ewk at amsat dot org and you will be listed on the events page.

[ANS thanks the AMSAT Field Ops team for the above information]

AMSAT Presence at 2015 Science City/Tucson Festival of Books

AMSAT took part in the University of Arizona's K7UAZ Amateur Radio
Club booth at the 2015 Science City/Tucson Festival of Books, on the
main mall of the University of Arizona in Tucson on Saturday, 14
March 2015. Science City/Tucson Festival of Books is a large science
fair held yearly in Tucson, and AMSAT is happy to support the K7UAZ
club.

More information about this event is available at:
http://www.sciencecity.arizona.edu/

During the day (0930-1730 local, 1630-0030 UTC), Patrick Stoddard
WD9EWK took advantage of opportunities for on-air demonstrations of
amateur satellite activity. Satellite demonstrations were conducted
using Patrick's WD9EWK call sign. The radio club's K7UAZ call sign
was used for making HF contacts. The University of Arizona campus is
in grid DM42.

Patrick posted updates during the day from Science City on his
@WD9EWK Twitter feed. If you aren't on Twitter, you can view these
in a web browser at:

http://twitter.com/WD9EWK

Satellite QSOs made during the demonstration using Patrick's WD9EWK
callsign will be uploaded to the Logbook of the World, and Patrick
have QSL cards available on request for those wanting to receive a
written confirmation. Please e-mail him with the
QSO details:
WDEWK at amsat dot org

The K7UAZ club callsign was used for using HF contacts, please
direct those QSL requests to the K7UAZ club, email to
k7uazarc at gmail dot com, or at the club's postal address:

K7UAZ Amateur Radio Club
Systems & Industrial Engineering Department
The University of Arizona
1127 E. James E. Rogers Way
P.O. Box 210020
Tucson, AZ 85721-0020

PAtrick reports that QSOs were made using his WD9EWK callsign via AO-
7, AO-73, FO-29, SO-50 and a QSO using APRS messages via the ISS
packet digipeater. Patrick would like to thank Kirk Krenzel N7VGJ and
the K7UAZ Amateur Radio Club as well as the Ohio Valley Amateur Radio
Club W0HF, for their hospitality in Tucson.

[ANS thanks Patrick WD9EWK for the above information]

New SpaceMath(a)NASA Resources Available

Explore behind-the-scenes mathematics that occur when scientists make discoveries and engineers solve technical problems in spacecraft design and spaceflight. Each module uses press releases to spark student interest, then standards-based mathematics and science skills are explored that relate to the missions discussed. New modules are now available that focus on the SAGE III stratospheric aerosol mission and the JPL InSight Mars Lander mission to be launched in 2016. The multimedia modules follow the 5E education approach.

The SAGE III stratospheric aerosol mission modules are available at http://spacemath.gsfc.nasa.gov/SAGEIII/SAGEIII.html.

The JPL InSight Mars Lander mission modules are available at http://spacemath.gsfc.nasa.gov/Mars.html.

Questions about these resources should be directed to Dr. Sten Odenwald at
sten.f.odenwald at nasa dot gov.

[ANS thanks NASA Education Express Message -- March 5, 2015 for the above information]

2015 NASA Office of Education -- Aeronautics Undergraduate Scholarship

NASA's Office of Education is accepting applications for the for the Aeronautics Undergraduate Scholarship, or AUS, program. The Aeronautics Undergraduate Scholarship is for individuals pursuing or planning to pursue undergraduate studies leading to an Associate's or a Bachelor's degree in areas related to aeronautics. These scholarships are directed toward enhancing the state of aeronautics for the nation, transforming the nation's air transportation system, and developing the knowledge, tools, and technologies to support future air and space vehicles.

Eligible students include freshmen, sophomores and juniors at the undergraduate level. Applicants must be U.S. citizens or nationals. The scholarship includes 75% of tuition up to $9,000 academic scholarship, based on tuition amount, and $6,000 for a summer internship.

Applications are due March 31, 2015.

Applications should be submitted through the NASA One Stop Shopping Initiative at http://intern.nasa.gov. Applicants should be sure to select "scholarship" for the type of application.

Questions about the 2015 Aeronautics Undergraduate Scholarship opportunity should be emailed to:
NASA.ASP2015 at nasaprs dot com.

[ANS thanks NASA Education Express Message -- March 5, 2015 for the above information]

ARISS School Proposal Window, for US, Remains Open Through April 15

February 17, 2015 - ARISS is now accepting proposals for U.S. schools wishing to schedule contacts between their students and the International Space Station for the next cycle. Details on submitting proposals can be found below in the attached ARRL News Release.

Message to US Educators

Amateur Radio on the International Space Station

Contact Opportunity

Call for Proposals
Proposal Window February 15 - April 15, 2015

The Amateur Radio on the International Space Station (ARISS) Program is seeking formal and informal education institutions and organizations, individually or working together, to host an Amateur Radio contact with a crew member on board the ISS. ARISS anticipates that the contact would be held between *January 1, 2016 and June 30, 2016*. Crew scheduling and ISS orbits will determine the exact contact dates. To maximize these radio contact opportunities, ARISS is looking for organizations that will draw large numbers of participants and integrate the contact into a well-developed education plan.

The deadline to submit a proposal is April 15, 2015.
Proposal information and documents can be found at www.arrl.org/hosting-an-ariss-contact.

The Opportunity

Crew members aboard the International Space Station will participate in scheduled Amateur Radio contacts. These radio contacts are approximately 10 minutes in length and allow students and educators to interact with the astronauts through a question-and-answer session.

An ARISS contact is a voice-only communication opportunity via Amateur Radio between astronauts and cosmonauts aboard the space station and classrooms and communities. ARISS contacts afford education audiences the opportunity to learn firsthand from astronauts what it is like to live and work in space and to learn about space research conducted on the ISS. Students also will have an opportunity to learn about satellite communication, wireless technology, and radio science. Because of the nature of human spaceflight and the complexity of scheduling activities aboard the ISS, organizations must demonstrate flexibility to accommodate changes in contact dates and times.

Amateur Radio organizations around the world, NASA, and space agencies in Russia, Canada, Japan and Europe sponsor this educational opportunity by providing the equipment and operational support to enable direct communication between crew on the ISS and students around the world via Amateur Radio. In the US, the program is managed by AMSAT (Radio Amateur Satellite Corporation) and ARRL (American Radio Relay League) in partnership with NASA.

More Information

Interested parties can find more information about the program at www.ariss.org and www.arrl.org/ARISS.

For proposal information and more details such as expectations, proposal guidelines and proposal form, and dates and times of Information Sessions go to www.arrl.org/hosting-an-ariss-contact.

Information Sessions are available for those wishing to obtain more information or to ask questions about the ARISS Proposal process. Upcoming sessions will be held Monday March 16 at 7pm EDT and Thursday March 26 at 4pm EDT. Those interested in attending one of these sessions should send email to ariss at arrl dot org to request login information.

Please direct any questions to ariss at arrl dot org.

[ANS thanks ARISS for the above information]

More satellite DX News:

Mike, WA0SPG, who will be on his first DXpedition, will be active as WA0SPG/4 from the Dry Tortugas between May 4-6th. Activity will be on the HF bands using CW and SSB. Equipment will be a KX3 and a FT-817 into a buddipole vertical dipole near saltwater, Alpha vertical and Loop antenna.

Mike will also be on the satellite using 2x FT-817's for SO-50 and FO-29 (CW/SSB) with both arrow and elk antennas. All power will be by Goal Zero batteries being charged by Solar PV panels. QSL via his home callsign. Clayton, W5PFG says several AMSAT satellite operators are working with Mike to prepare for this trip.

[ANS thanks the OPDX Bulletin, John Papay, K8YSE, and Clayton, W5PFG for the above information]

$50SAT/MO-76: 15 months, 15 orbits per day, and some unexpected behavior

Saturday, February 21, 2015 marked the 15 month anniversary of the launch of $50SAT/MO-76, and you guessed it - it is still operating.

Thursday, February 12, 2015 marked a different milestone - its orbit has decayed to the point where its mean motion crossed the 15 orbits per day threshold. The TLEs from Saturday, February 21, 2015 indicate it is now at 15.00521293 orbits per day.

Some people noticed that something odd started happening on Monday, February 23, and Tuesday, February 24. The $50SAT/MO-76 team noticed the same thing - during daytime passes in the northern hemisphere, $50SAT was transmitting once per minute, always sending telemetry in RTTY format, but never sending GFSK telemetry packets. Moreover, the total reset count kept going up by one each time.

The link below will list all the RTTY telemetry messages (of which the $50SAT/MO-76 team are aware) gathered on February 23 and 24:

http://amsat-uk.org/2015/03/05/mo-76-15-months/

What seems to be happening on the decending (daytime) passes is the CPU is reset just after sending a full RTTY telemetry message, as here are no GFSK packets sent, but within a half minute the FM Morse beacon is heard with Stuart's callsign (GW7HPW, the first one in the rotation). The teams guess is that the battery voltage is decaying during the operational cycle, and goes below the 2.9V reset threshold just after sending the RTTY or just as it is about to send the GFSK packets. nce the satellite is able to enable solar power (PCB temperature >= 0 degrees C), it starts behaving normally; it is now able to send GFSK packets. During ascending (nighttime) passes, it behaves normally, at least here in EN82 land.

There was a brief time where this behavior stopped (2015-02-25, 17:05 UTC through 2015-02-26, 3:47 UTC). It did, however, start back up sometime before 2015-02-26, 05:21 UTC, and has continued since.

Why is this happening now? The team is still investigating, but it is apparent when looking at the chart of battery voltage over the lifetime of $50SAT/MO-76 that the battery has suffered a sizeable drop in capacity. If the battery voltage under load is dropping below 2.9V, how is it able to recover back above 3.3 V (the minimum required to enable transmission) and nearly complete another operational cycle? Moreover, why does it always seem to be able to finish sending an entire RTTY packet before resetting? In the hopes of better understanding what is happening, I am in the process of re-assembling my "BoxSat" test setup in an effort to reproduce on the ground what is happening in space. In the meantime, the once-per-minute transmission is actually convenient from telemetry monitoring standpoint, as one no longer has to wait 3 minutes for $50SAT/MO-76 to start transmitting. So, for any of you who have not heard $50SAT/MO-76, now is the time. Who knows how long it will continue to operate in this manner? Who knows how long it will continue to operated at all? Every time an anomaly has occurred and thought, "this is it - well, it was great while it lasted", $50SAT/MO-76 has proven to survive. The team hopes that is the case here as well.

The Dropbox has been updated with all the telemetry observations through (Wednesday, March 4 2015, and can be accessed via the following URL:

http://tinyurl.com/ANS-074-50Dollar-Telemetry

I have also uploaded an MP3 file from the daytime pass over EN82 land on Friday, February 27, 2015 starting at 16:59 UTC (11:59 AM local time); it can be accessed via the following URL:

http://tinyurl.com/ANS-074-50Dollar-MP3

During the recording, I switch back and forth between FM and LSB modes so I can hear the FM Morse beacon as well as the RTTY telemetry.

Please keep the telemetry observations coming, especially now!

$50SAT was a collaborative education project between Professor Bob Twiggs, KE6QMD, Morehead State University and three other radio amateurs, Howie DeFelice, AB2S, Michael Kirkhart, KD8QBA, and Stuart Robinson, GW7HPW. The transmitter power is just 100 mW on 437.505 MHz (+/-9 kHz Doppler shift) FM CW/RTTY. $50SAT uses the low cost Hope RFM22B single chip radio and PICAXE 40X2 processor.

There is a discussion group for $50SAT
http://groups.yahoo.com/groups/50dollarsat/

50DollarSat http://www.50dollarsat.info/

[ANS Thanks Michael Kirkhart KD8QBA, the $50SAT/MO-76 team and AMSAT-UK for the above information]

ARISS News

Double School Contact for Samantha Cristoforetti, IZØUDF

Saturday, March 7, 2015 at 10:51 UTC, 11:51 local time and at 12:29 UTC, 13:29 local time, students at "G. Salvemini - G. La Pira", Montemurlo, Italy, and "Dante Alighieri" 1st Grade Secondary (Middle) School, Casale Monferrato, Italy established two ARISS contacts with ESA astronaut Samantha Cristoforetti, IZØUDF onboard the International Space Station. These were direct contacts performed by Amateur radio ground stations IQ5VR, located at "G. Salvemini - G. La Pira" in Montemurlo and IK1SLD located at "Dante Alighieri" School in Casale Monferrato.

Presentation G. Salvemini - G. La Pira
The school "Salvemini - La Pira" is in Montemurlo, province of Prato, Tuscany region and it is a Secondary Middle School; it has 21 classes with pupils aged between 11 and 14. The name of the school derives from the fusion of the two schools of the commune. This is the only secondary middle school of the area. The schoolhouse hosts around 520 pupils.

Presentation "Dante Alighieri"
The "Dante Alighieri" School is situated a bit off the town centre of Casale Monferrato, near the ancient Cittadella, province of Alessandria, Piedmont region. It's a modern construction, developed on two main buildings: one for the school's didactical and administrative activities, one for the sport activities (gym and pool). It's surrounded by a wide playground, with a little plantation of poplars, planted by the pupils of the school. There are 12 classrooms (4 at the main floor and 8 at the first floor) and different labs: Science lab, Informatics lab, Techno lab, Art lab, Maths lab, Languages lab and a coloured and wide library. There is also a lot of afternoon activities, such as Latin courses, Languages courses and sport tournaments (soccer, basket, volley). The Dante Secondary I grade School has a current roll of 230 and a teaching staff of 29. In the last few years the school has been enhanced by the richness of its diverse student population.

Mentor Francesco De Paolis IK0WGF proposed to the radio coordinators Mr. Alessandro Tesconi IK5EHI and Mr. Claudio Ariotti IK1SLD to set up a combined direct contact, with the support by IK1SLD back-up ground station and this was accepted. A phone conference call allowed the full sharing of the events between all the contact sites involved. The sequence of questions was made alternately by the students at two schools. ESA astronaut Paolo Nespoli IZ0JPA participating to the event in the Montemurlo school, presented the International Space Station, talked about his experience aboard and before the AOS trained the students for thecontact. Great Paolo!

Contact was established at 10:51 UTC, 11:51 local time with IR0ISS via IK1SLD and then via IQ5VR, alternately. Mr. Claudio Ariotti IK1SLD proposed to astronaut continue the contact during the following orbit. ESA Astronaut Samantha Cristoforetti IZ0UDF agreed. During the first scheduled contact Cristoforetti answered 10 questions from students. Samantha Cristoforetti was really very

accurate in giving the answers with many details.

At 12:29 UTC, 13:29 local time, contact was established again with IR0ISS, not on the primary channel, which was interfered, but on a back-up channel where the event continued normally without problem. During the second random contact Cristoforetti answered 11 questions from students and exchanged greetings with the schools. Signals from the ISS were good during both passes.

Both contacts established with IR0ISS were webcast live on:
http://www.livestream.com/amsat_italia (from Montemurlo)
http://www.livestream.com/ariss (from Casale Monferrato)

The Montemurlo event is available at:
https://www.youtube.com/watch?v=egJ72f_I6To

The Casale Monferrato event is available at:
http://livestre.am/545U4

Regional and Local Televisions and newspapers covered the event also. About 700 students, parents, visitors and media attended the events at contact sites.

The event was announced on ESA Portal - National News:
http://tinyurl.com/ANS074-ESAPortalNews
(Information is in Italian)

[ANS thanks Francesco IK0WGF for the above information]

+ A Successful contact was made between SCHOOL CITY DIVISION COUNTRY and Astronaut FNAME LNAME CALLSIGN using CALLSIGN NA1SS/IRØISS. The contact began YYYY-MM-DD HH:MM UTC and lasted about nine and a half minutes. Contact was direct/telebridged via CALLSIGN. ARISS Mentor was CALLSIGN.

Upcoming ARISS Contact Schedule

Collège Paul Langevin, Saint Junien, France, direct via F8KFZ/P and
Ecole "La Malmaison", Rueil-Malmaison, France, direct via F6KFA/p
The ISS callsign is presently scheduled to be IRØISS
The scheduled astronaut is Samantha Cristoforetti IZØUDF
Contact is a go for: Thu 2015-03-19 08:17:56 UTC

ARISS is always glad to receive listener reports for any of the contacts. ARISS thanks everyone in advance for their assistance. Feel free to send your reports to
aj9n at amsat dot org or aj9n at aol dot com.

[ANS thanks ARISS, Charlie AJ9N and David AA4KN for the above information]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive addi-tional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
EMike McCardel, KC8YLD
kc8yld at amsat dot org